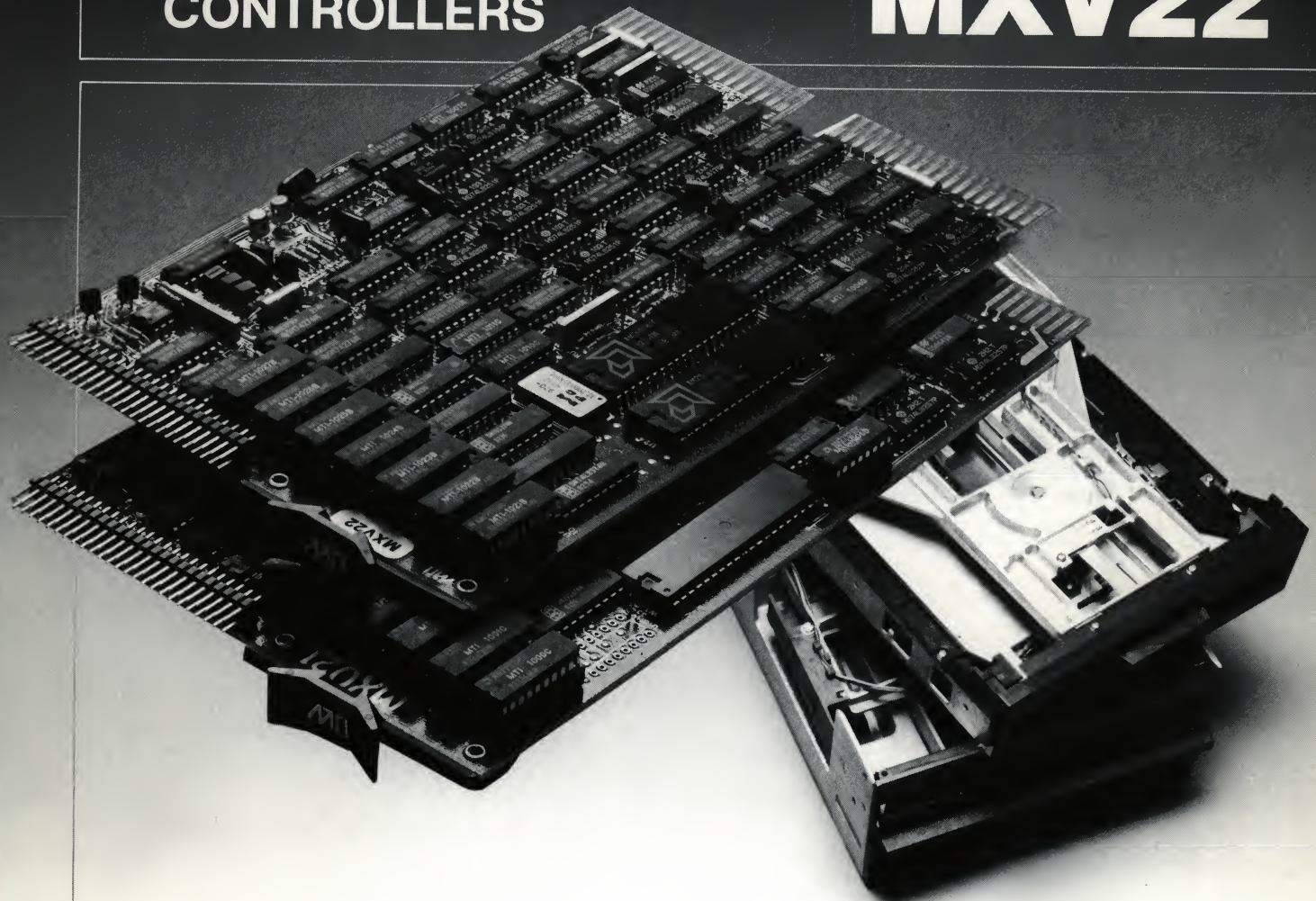


DEC®RX02 COMPATIBLE 8" FLOPPY DISK CONTROLLERS

MXV21 MXV22



- 22 bit address capability
- All electronics contained on one dual-height card
- DEC®RX01/RX02 media compatible
- Totally DEC®RX02 hardware and software compatible
- LSI 11, LSI 11/2 and LSI 11/23 compatible
- Alternate address/vector selection
- Four level device interrupt priority
- Shugart drive interface
- 12 MHz crystal controlled clock

On a single, dual-height board, the MXV21 and the MXV22 controllers contain all the interface and control electronics necessary for full compatibility with the DEC®RX02 Floppy 1, Disk Drives in LSI 11, LSI 11/2 and LSI 11/23 Micro Computers. The MXV21 version provides 18 bit address capability and supports two drives, while the MXV22 version provides a full 22 bit address and supports up to four drives, for newer LSI-11/23 microcomputer systems. Both the MXV21 and the MXV22 controllers are compatible with IBM 3740 formatting, provide write precompensation, write current control and have power fail protection built-in. Bootstrap firmware is transparent to the operating system. The MXV21 and the MXV22 are capable of controlling single sided, single and double density drives as well as double sided drives. And, because they plug directly into the LSI backplane, the MXV21 and MXV22 are easy to incorporate into your DEC®system.


Micro Technology, Inc.
THE KEY TO OPTIMUM STORAGE

MXV21/22 Controller

Hardware, software and media compatible with the DEC®RX02 floppy disk system, the MXV21 and the MXV22 were designed for LSI 11, LSI 11/2 and LSI 11/23 users. All circuitry is contained on one dual-height card which plugs directly into any standard LSI 11 backplane and interfaces through a 50 conductor ribbon cable (figure 1) to any Shugart compatible drive. The card features a transparent firmware bootstrap which automatically loads either single or double density diskettes; IBM 3740 formatting capability; alternate address and vector selection; jumper selectable four-level device interrupt priority; power fail protection; write current control signal to reduce the write current for tracks greater than forty-three, and write pre-compensation for reduced error rates.

Bootstrap

The bootstrap is initiated whenever program execution is started at location 173000₈. Both drives are homed to track 0. Then track 1, sector 1 of unit 0 is read and diskette density is determined. If the diskette is single density, sectors 1, 3, 5 and 7 are loaded starting at location 0. If the diskette is double density, sectors 1 and 3 are loaded. Program execution is then transferred to location 0. This feature can be disabled by pin jumper at the user's option.

Formatting

The MXV21 and the MXV22 provide two pass formatting which writes and checks sector headers prior to recording data fields. The data fields are recorded in either single or double density as defined by the user command. The formatted diskette is compatible with DEC RX01, RX02 or IBM 3740.

Device Address/Interrupt Priority

The MXV21 and the MXV22 are shipped with the standard device address 177170₈, interrupt vector 264₈ and interrupt priority level four. The alternate address and vector are selectable by pin jumpers. Other interrupt priority levels are selectable by jumpers.

Power Failure Protection

When the LSI 11 system signals an impending DC power failure, the MXV21 and the MXV22 controller will no longer initiate a write sequence. However the controller has the capability to complete any sector currently being written.

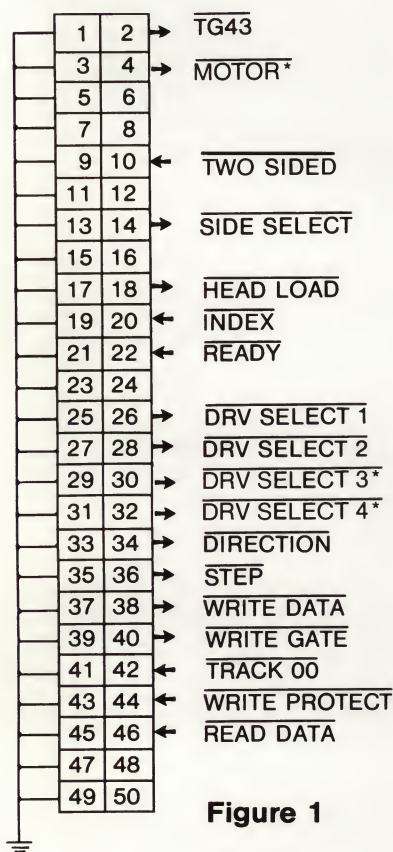
Write Current Control

The MXV21 and the MXV22 provide the necessary signal to reduce the write current for tracks greater than forty-three. This signal is available at pin 2 of the 50 pin ribbon connector.

Write Precompensation

All drives exhibit the phenomenon of apparently time displacing recorded bits in certain bit patterns. Unless some provision is made to compensate for this effect, data retrieved from the disk may display a higher error rate. The MXV21 and the MXV22 provide hardware write precompensation which reduces the apparent bit shift. This unique feature allows the controller to perform reliably with any Shugart compatible drive. For more detailed information refer to *Shugart Associates Application Bulletin—SA800 series diskette storage drive double density design guide*.

DRIVE INTERFACE



REGISTER FORMATS

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
ERROR	RX INIT	EXT ADDR	RXO 2			HEAD SEL	DEN	TR	INTR ENB	DONE	UNIT SEL	FUNCTION			GO

MXVCS

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00

MXVDB

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
				NXM	WC OVFL	HEAD SEL	UNIT SEL	DRV RDY	DD	DRV DEN	DEN ERR	AC LO	ID	SIDE RDY	CRC

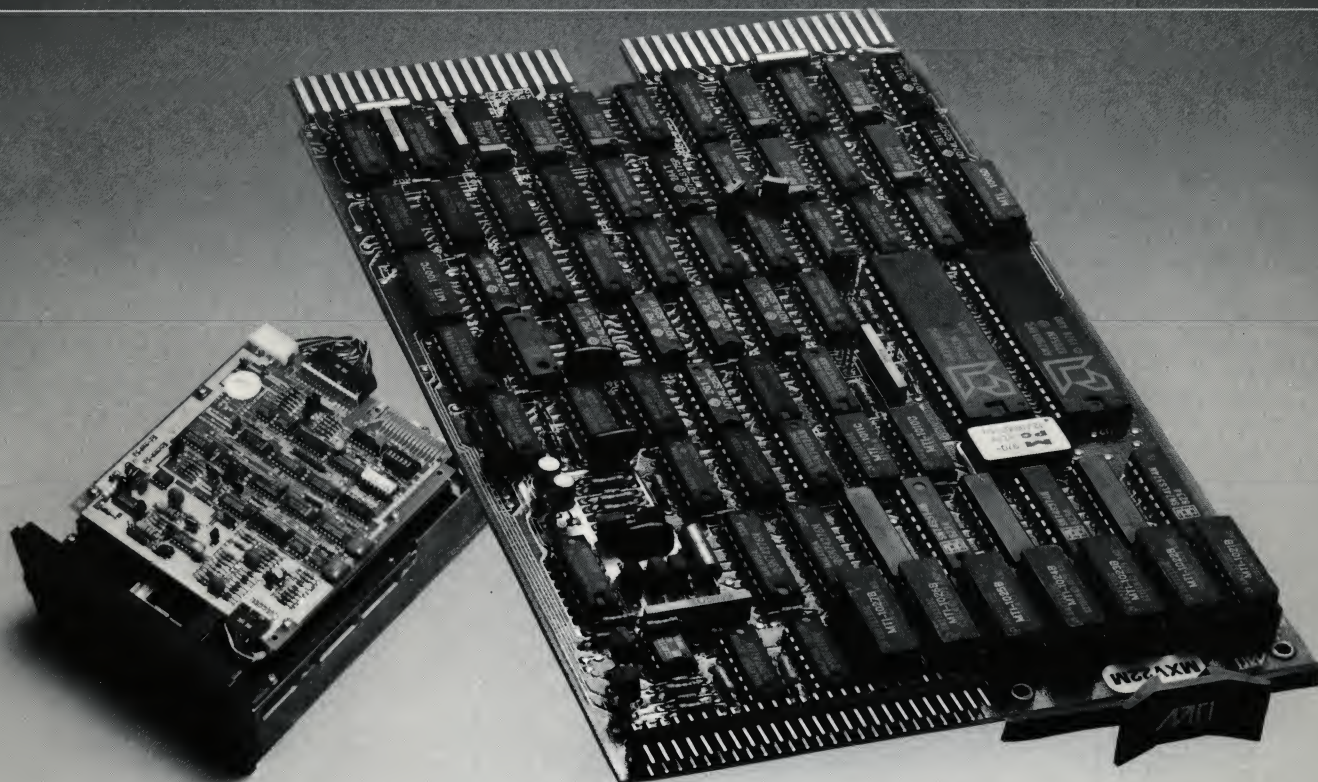
MXVES

SPECIFICATIONS

RECORDING TECHNIQUE	SINGLE DENSITY	IBM 3740 FM
	DOUBLE DENSITY	DEC MODIFIED MFM
POWER REQUIREMENTS	VOLTAGE	SINGLE 5V SUPPLY (from LSI-11 Back Plane)
	CURRENT	2.5 AMPS TYPICAL
OPERATING LIMITS	TEMPERATURE	0 - 45° C
	HUMIDITY	10% - 95% NON-CONDENSING

DEC®RX02 COMPATIBLE 5¼" FLOPPY DISK CONTROLLER

MXV22M



- All interface, bootstrap, and format electronics are contained on one dual-height card.
- DEC®RX02 hardware and software compatible.
- DEC®LSI-11, LSI-11/2, LSI-11/23 compatible.
- Operation on standard device address and interrupt vector.
- Four level device interrupt priority.
- Write precompensation and Augmented phase locked loop for improved data recovery.
- Power fail protection.
- Transparent Firmware Bootstrap.

Major advances in the data storage capacity and data recording techniques with 5¼-inch Mini-floppy disk drive technology have enabled MICRO TECHNOLOGY to successfully map the DEC®RX02 format onto a 5¼-inch double-sided double-density diskette.

The MXV22M is totally software and hardware compatible with the DEC®RX02 8-inch Floppy Disk Subsystem. The RX02 format is uniquely accomplished through the use of a 96 TPI double-sided double-density 5¼-inch Mini-floppy disk drive by recording thirteen sectors on side zero and thirteen sectors on side one on each of seventy-seven of the eighty cylinders available on the 5¼-inch diskette media. This mapping provides 974 blocks of data storage using RT-11 formats with each block containing 512 bytes of data.

The MXV22M was designed for LSI-11, LSI-11/2, and LSI-11/23 Micro Computer users. All circuitry is contained on one dual-height card which plugs directly into any standard LSI-11 backplane. And interfaces to the Tandon Model T100-4 or Shugart SA460 compatible Mini-floppy drive.


Micro Technology, Inc.
THE KEY TO OPTIMUM STORAGE

Bootstrap

The bootstrap is initiated whenever program execution is started at location 173000_h. Both drives are homed to track 0. Then track 1, sector 1 of unit 0 is read and diskette density is determined. If the diskette is single density, sectors 1, 3, 5 and 7 are loaded starting at location 0. If the diskette is double density, sectors 1 and 3 are loaded. Program execution is then transferred to location 0. This feature can be disabled by pin jumper at the user's option.

Formatting

The MXV22M provides two pass formatting which writes and checks sector headers prior to recording data fields. The data fields are recorded in either single or double density as defined by the user command. The formatted diskette is compatible with DEC®RX01, RX02 or IBM3740.

Augmented Phase Locked Loop

The MXV22M utilizes a proprietary design to very accurately read data from the recorded tracks. Having the speed to read each data bit, the 2901 Microprocessor has the ability to control the phase locked loop during the noisy areas of the format. By gating the phase locked loop on and off in-phase with the synchronized data stream, a shorter capture range for data lock-on and a higher data tracking factor can be achieved without sacrificing stability or suffering any loss of data reliability.

Device Address/Interrupt Priority

The MXV22M is shipped with the standard device address 177170_h, interrupt vector 264_h and interrupt priority level four. The alternate address and vector are selectable by pin jumpers. Other interrupt priority levels are selectable by jumpers.

Power Failure Protection

All drives exhibit the phenomenon of apparently time displacing recorded bits in certain bit patterns. Unless some provision is made to compensate for this effect, data retrieved from the disk may display a higher error rate. The MXV22M provides hardware write precompensation which reduces the apparent bit shift. This unique feature allows the controller to perform reliably with any Shugart compatible drive. For more detailed information refer to *Shugart Associates Application Bulletin—SA800 series diskette storage drive double density design guide*.

Write Precompensation

When the LSI-11 system signals an impending DC power failure, the MXV22M controller will no longer initiate a write sequence. However the controller has the capability to complete any sector currently being written.

DRIVE INTERFACE

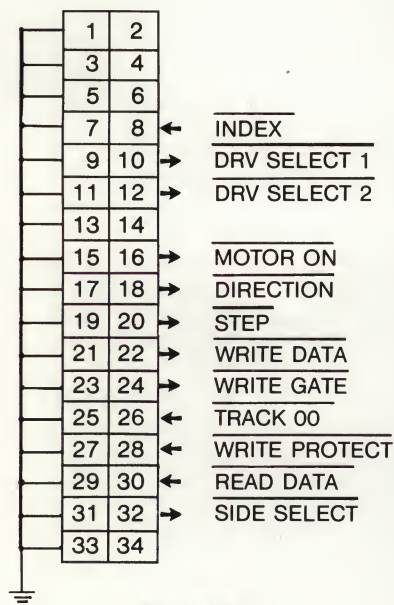


Figure 1

REGISTER FORMATS

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
ERROR	RX INIT		EXT ADDR	RX02		HEAD SEL	DEN	TR	INTR ENB	DONE	UNIT SEL		FUNCTION		GO

MXVCS

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00

MXVDB

15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
				NXM	WC OVFL	HEAD SEL	UNIT SEL	DRV RDY	DD	DRV DEN	DEN ERR	AC LO	ID	SIDE RDY	CRC

MXVES

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